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SOUTHERN CALIFORNIA CHEMICAL

GROUNDWATER

EPA

SPLIT

SAMPLING & ANALYSIS PLAN

Purpose: RCRA Site Split Sampling Plan

Site: Southern California Chemical
Santa Fe Springs, CA

Date of Proposed Sampling: October 22-26, 1990

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1.0 OBJECTIVE

The primary objective of this investigation is to perform field oversight of quarterly groundwater sampling activities conducted by Camp Dresser & McKee (CDM) at Southern California Chemical (SCC) in Santa Fe Springs, California. A Consent Order dated December 8, 1988 has been signed between the United States Environmental Protection Agency (EPA) and CP Chemical, the parent company of SCC, for site clean-up and monitoring. The Order is issued under the auspices of the Resource Conservation and Recovery Act (RCRA).

This split sampling plan is written for the EPA to satisfy two objectives:

1. To collect data from approximately one-quarter of the monitoring wells at SCC. This data will be used to confirm data concurrently collected by CDM at these same wells; and
2. EPA will also be supplementing data collected by CDM through the collection of samples to be analyzed for total metals, a parameter that CDM has chosen not to investigate.

This sample plan is written to be performed in conjunction with and based upon work to be performed as outlined in the CDM Workplan for RCRA Facility Investigation, June 8, 1990. The sampling activities requested in this plan will be performed by CDM and will be audited by the EPA during the sampling event.

2.0 SITE BACKGROUND AND PHYSICAL SETTING

2.1 SITE HISTORY

Since 1958, Southern California Chemical (SCC) has owned and operated the 4.8 acre inorganic chemical manufacturing and recycling facility at 8851 Dice Road in Santa Fe Springs, Los Angeles County, California. (See Figure 1). From the late 1940s the site was occupied by a foundry casting facility. SCC is a division of CP Chemicals, Inc., a New Jersey corporation, and presently operates as a RCRA Interim Status Hazardous Waste Management Facility. In addition SCC currently operates under a Conditional Use Permit issued by the city of Santa Fe Springs.

SCC receives a variety of aqueous hazardous wastes and recyclable materials from generators primarily in the electronics and aerospace industries. It operates a variety of waste management units and manufacturing and operational processes including holding ponds, settling tanks, holding tanks, wastewater treatment tanks, filter presses, multi-stage clarifiers, process and storm drain sumps, drum storage areas, and drum and truck washing areas. Contaminants found in the wastes include copper, iron, ammonium bifluoride, tin, lead, chromium, nickel, assorted trace heavy metals, sulfates, chlorides, and hydroxides. The hazardous residues and sludges generated by the facility are transported to a Class I landfill or a heavy metal smelter/producer for recycling in accordance with California Department of Health Services (DHS) regulations.

Available analytical data from groundwater samples indicate the presence of two primary contaminant plumes beneath the facility, in the Hollydale Aquifer, where SCC monitoring wells are screened. The plume constituents have been found at varying concentrations and lateral extent over time. A main plume consists primarily of inorganic compounds and appears to be aligned in a northeasterly direction. A second plume, consists of halogenated and non-halogenated organic compounds.

2.2 SITE GEOLOGY AND GEOHYDROLOGY

The SCC facility is located in the Central Ground Water Basin of the Los Angeles County Coastal Plain. The Central Basin is divided into four parts: the Los Angeles Forebay area, the Montebello Forebay area, the Central Basin Pressure area, and the Whittier Forebay area. The SCC facility is located near the juncture of the Montebello and Whittier Forebay areas and the Central Basin Pressure area. See Figure 2.

Situated on relatively flat land which slopes very gently from the northeast to the southwest, elevations range from 148 to 154 feet mean sea level (msl). Regional drainage is directly towards the San Gabriel River, one mile west of the facility.

Evidence of artesian conditions and heterogeneous stratigraphy indicate that the facility is located in a pressure area although literature maps indicate that the facility is geographically located in the Montebello Forebay area. The Bellflower Aquiclude is the uppermost confining unit on the site and also overlies the Gage Aquifer. The Bellflower Aquiclude is approximately 5 to 15 feet thick and consists of low permeability clays, silts, silty clays, sandy clays, and gravelly clays.

The Gage Aquifer is the uppermost aquifer in the region, but at the facility the aquifer has been documented as being essentially dry. It is assumed that the Hollydale Aquifer is the uppermost water-bearing unit at the facility. To date, all groundwater samples have been obtained from this aquifer. Soil samples for analysis have been proposed at 25 feet to investigate the integrity of the Gage Aquifer.

The general regional groundwater gradient in the Santa Fe Springs area is south to southwest. Water levels in facility monitoring wells indicate a site-specific flow to the south-southwest. Groundwater level contour maps developed from quaterly sampling data for the period March 1986 to January 1990 indicate that groundwater levels at the site are seasonally higher in late spring and summer and seasonally lower in late fall and winter. The data also show that water levels in on-site wells have declined by as much as 10 feet between mid-1985 and mid-1988. See Figure 3 for 1990 groundwater contour data.

The Hollydale Aquifer is a brown, fine to medium silty sand with some gravel and pebbles. The aquifer is approximately 40 feet thick with a basal depth of approximately 100 feet. The Hollydale Aquifer overlies a thin aquitard, approximately 10 feet thick, which in turn overlies the Jefferson Aquifer, an extensive and highly folded unit. While available information indicates that the Gage and Hollydale Aquifers are hydraulically interconnected within one mile off-site, this is not confirmed at the facility. CDM will be performing aquifer tests to verify interconnection as one of their tasks.

Twenty-two site wells exist, which CDM will monitor in this event. The EPA will monitor six of these wells, at screened intervals between 45 to 75 feet and at about 125 ft. below ground surface. One new well pair, MW-15, will be sampled by the EPA. The wells will be completed at the base, approximately 125 feet, and at the top, approximately 75 feet, of the Hollydale Aquifer. Screened intervals in the shallow wells will be approximately 45-75 feet deep. Screened intervals in the deep wells will be in the lowermost 15 feet of the Hollydale Aquifer. This is to match the screened interval of the one existing on-site deep well (MW-4A).

3.0 MAPS and ILLUSTRATIONS

Figure 1. Site Location Map

Figure 2. East/West Regional Geologic Cross-Section

Figure 3. Groundwater Elevation--Hollydale Aquifer, January 1990

Figure 4. Sample Location Map

4.0 RATIONALE FOR SAMPLE LOCATIONS, NUMBER OF SAMPLES, AND ANALYTICAL PARAMETERS

4.1 NUMBER OF SAMPLES AND PARAMETERS

Camp Dresser & McKee will sample all 22 site groundwater monitoring wells. Their proposed analyses will include the use of RCRA approved EPA SW-846 methods, Clean Water Act methods 601/602, and at selected well locations, the Appendix IX analytes. At the time of this writing, EPA plans to collect 6 samples which will include 4 wells of known moderate and low contamination, and 2 new wells which will be sampled in this event for the first time.

The EPA will analyze for all of the same parameters as CDM, however EPA will request additional analyses for total metals and specific anions. Samples will also be collected to analyze for cyanide, mercury, hexavalent chromium, and specific anions that are listed in Table 5-2. SAS requests for these analyses are included in Section 5.0, Request for Analysis. Semi-volatiles and pesticides/PCBs will be analyzed by Routine Analytical Services (RAS) methods in the EPA Region 9 Laboratory in Las Vegas. A RAS plus Special Analytical Services (SAS) request method for low detection volatiles will be submitted to the Region 9 Laboratory for this analysis.

Appendix C lists the CDM proposed analyses. Analytical parameters for EPA split samples are further discussed and listed in Table 5-1 of Section 5.0 of this plan.

4.2 SAMPLE LOCATIONS

The EPA will take 10 groundwater samples, including one duplicate sample, one laboratory QC sample, and up to 3 field blank samples as necessary (one blank per day). Wells which will be split sampled will be existing wells MW-3, MW-4, MW-4A, MW-6B, and two new wells, MW-15S and MW-15D.

Well MW-3 will be sampled to confirm the concentrations, presence or absence of previously discovered volatiles and other parameters at this location. This well has historically shown elevated levels of TCE. Well MW-3 is positioned at the westerly edge of the main plume, and it is the only sample location available in this area at this time. Information from this well will be compared to past data to investigate the possibility of concentration changes and to verify the extent of the plume. It is situated in an area which historically received and clarified SCC process wastewater from Pond 1.

Both shallow and deep wells, MW-4 and MW-4A, will be sampled. These wells are located near Pond 1. Historically this area was used as a settling pond for facility processes. Total chromium has been discovered at levels up to 500 mg/l in past groundwater data, and hexavalent chromium has been discovered at this location at levels of up to 33 mg/l in January 1989.

Well MW-6B will be sampled to verify CDM results, and to check results for possible changes at this location. This well is located at the southern perimeter of the site boundary near Pond 4 in the vicinity of inactive sumps and copper cement drying ponds. It has historically shown very low levels to non detected levels of contamination, and will provide a check on CDM's lower limits of detection. Low levels of TCA, TCE and chloride and nitrate from Pond 1 sludges may be found here.

Two new wells at locations MW-15S and MW-15D, located at the southern site boundary, will be sampled to compare analytical results between CDM and EPA data, and to develop a database on these new locations. The deep aquifer will be characterized here for the first time at 125 ft. below ground surface. The location of this well is intended to fill data gaps existing related to the downgradient extent of the main plume. These wells are located in the vicinity of inactive wastewater treatment tanks and active drum storage and process wastewater treatment operations. There is also interest in the data at this site concerning the fate and transport of contaminants from the Pond 1 area located upgradient from the well. Data have historically shown non-detects in one other existing nearby shallow monitoring well, MW-5. It is important to sample the groundwater at the shallow and deeper depths for purposes of determining groundwater connection.

A duplicate and a laboratory QC sample aliquot will each be taken at well MW-4. These will be taken at this location because elevated levels of contamination are expected to be found here, making this a good site for a laboratory check of precision and accuracy. Field blanks will be taken, one per day, using metal free deionized-distilled organic free water, poured

directly into the appropriate bottles for each parameter. The QC sample aliquot will be taken in double volume.

4.3 OPTIONAL SAMPLE PLAN

There is a possibility that budgetary changes may require that the original sample plan be amended to reduce costs. The following sampling schemes are proposed as contingencies, should this become necessary.

1. Blank samples would be taken once daily for the organic and semi-organic analyses, but only a single blank sample would be collected for the total metals analyses. All other blank samples would be deleted from the original plan.

If further cutbacks become necessary, the second contingency will be implemented, as follows:

2. Samples from well locations MW-3, MW-4A and MW-15D would be deleted, leaving samples to be collected from wells MW-4, MW-6B, and MW-15S.

The well locations chosen to be sampled remain those that consistently show the greatest levels of contaminant concentrations.

5.0 REQUEST FOR ANALYSIS

A total of 10 groundwater samples, including one duplicate, one QC and three field blanks will be collected for volatile and semi-volatile organics, total and dissolved metals, and specific anion analyses by the EPA. The analyses requested are shown in Table 5-1, Request for Analysis. All samples are expected to be low level. Volatiles will be analyzed using a RAS plus SAS method of analysis for low quantitation limits. Analyses for pesticides/PCBs will be performed by RAS methods according to the Contract Laboratory Program Statement of Work.

Samples to be taken for the analyses of metals and anions, listed in Table 5-2 below, are to be analyzed by method 6010. Specific other metals will be analyzed by the following methods: method 245.2 for mercury; cyanide analysis by method 9010; and hexavalent chromium by method 218.4. Anions will be analyzed together by ICP method 300. All methods are EPA approved. Methods proposed by CDM may not be the exact methods proposed in this split sample plan for the same parameters in all cases, but this should not present significant problems with comparison of similar data. Special requests for the anions, the analyses of mercury, cyanide, hexavalent chromium and metals are included with the Request for Analysis Table 5-1.

TABLE 5-2

INORGANIC ANIONS AND METALS
(not listed on Table 5-1 for separate analysis)

<u>Analyte</u>	<u>Method</u>
Anions: Chloride	EPA Method 300 (Ion Chromatography)
Nitrate	EPA Method 300
Nitrite	EPA Method 300
Fluoride	EPA Method 300
Sulfate	EPA Method 300
Metals: Antimony	6010 (ICP)
Arsenic	6010
Barium	6010
Beryllium	6010
Cadmium	6010
Chromium III	6010
Cobalt	6010
Copper	6010
Iron	6010
Lead	6010
Nickel	6010
Selenium	6010
Silver	6010
Thallium	6010
Tin	6010
Vanadium	6010
Zinc	6010

6.0 METHODS AND PROCEDURES

6.1 Sample Collection

All split sample collection will be performed by CDM staff in conjunction with their proposed sampling effort. EPA will provide bottles for the split samples and will retain custody of the splits after collection until they are transferred to the shipment carrier for transport to the laboratory. The EPA samples will be collected at the same time that CDM collects their respective samples.

Groundwater samples will be collected by the use of dedicated bladder pumps. The EPA will be responsible for preserving their split samples in the field.

6.2 Disposal of Contaminated Materials

Disposable clothing will be worn if needed, as specified by specific site conditions. All clothing will be retired after use into plastic garbage bags for disposal as municipal waste.

Water which is purged during sampling will be disposed of by CDM according to their proposed plan. Disposal waters will be stored in 55 gallon plastic drums provided by SCC. The facility will assume responsibility for removal of the drums and disposal of the fluids into the facility wastewater treatment plant.

6.3 Decontamination

Decontamination of equipment used will be the responsibility of CDM. No EPA equipment will be used for sampling. CDM decontamination procedures are described in the Workplan for this facility, pages 4-82 and 4-83.

6.4 Sample Containers

Sample containers will come pre-cleaned from the laboratory ready for use. They are listed by type and appropriate number for sample collection in Table 5-1.

6.5 Sample Preservation

The EPA will be responsible for preservation of the split samples, according to the preservatives listed in Table 5-2. The volatile samples will be pre-acidified before filling. The samples collected for metals analyses will be adjusted to the proper pH after filling.

All samples will be stored continuously on ice in plastic coolers immediately upon collection and during shipment to the courier. Ice will be double bagged, and water from the ice melt which may collect in the bottom of the coolers will be drained as needed. This drain will be otherwise covered with duct tape on the outside of the coolers.

6.6 Sample Shipment and Packaging

All samples will be handled as low level environmental samples. the following sample packing and shipment procedures will be followed to ensure that samples are intact when they arrive at the designated laboratory. EPA sample shipment paperwork instructions may be found in Appendix A.

1. Place a custody seal over the bottle cap. With VOA vials, wrap the custody seal around the side of the lid, and not over the top. Wrap glass bottles in bubble wrap and tape to close.
2. Place each individual package of VOA samples into a plastic bag and seal by taping bag shut. Note the sample number on the outside of the package.
3. Place the protected bottles in the appropriate ice chest and add double-bagged ice to maintain the proper temperature inside the ice chest. Add additional ice as necessary to maintain temperature at 4 degrees Centigrade. Double bagging the ice will prevent water leakage into the cooler. Loose ice must not be poured into the cooler.
4. Fill empty spaces in the ice chest with either pelaspan (styrofoam popcorn) or bubble-pack wrap.
5. Enclose chain-of-custody form and CLP traffic report in the ice chest by placing it in a plastic zip-lock bag and taping the bag to the inside of the ice chest lid with strapping tape.
6. Seal the ice chest shut with strapping tape. Place two custody seals on the front and one on the back of each cooler so that the custody seals extend from the lid to the main body of the ice chest. Seal the drain plug near the base of the chest with strapping tape.
7. Label the chest with "Fragile" and "This End Up" labels. Include a label on each cooler with the lab address and the return address.
8. Ship ice chests to the appropriate laboratory via Express Overnight Deliver at least every other day of sampling. Chromium samples must be sent every day. If samples are shipped on Friday, arrangements must be made with the RSCC by noon on Friday for Saturday receipt at the laboratory.
9. Call the RSCC within 24 hours after sample shipment. See Appendix A for instructions on calling the RSCC.

6.7 Field Documentation

Field Notebooks: All sampling activities will be recorded into a bound field notebook. Entries will be dated, legible, written in permanent ink, and contain accurate and complete documentation of all project activities. Language will be factual and objective. Entries shall include:

1. Names of all personnel on both sampling teams
2. Signatures of persons making entries
3. General descriptions of weather conditions
4. Location of each sampling point
5. Observations of PRP sampling procedures
6. Volume of water purged from wells, including times from start to completion, and dates
7. Date and times of sample collection
8. Reference to photographs taken
9. Field observations and descriptions of problems encountered or changes made to the original plan
10. Duplicate, QC, background and blank sample methods and locations
11. Legible corrections, which will be single lines through the error, will be signed and dated by the person making the correction.

Where photographs are taken of procedures, a separate field photograph log shall be kept with the field notes.

CLP Paperwork: CLP RAS Traffic Reports, Chain-of-Custody forms and QA/QC summary forms will be completed for all samples. The forms will be filled out according to the instructions included in Appendix A of this plan. A separate chain-of-custody form will accompany each cooler. A RAS Traffic report will be completed for each shipment to the laboratory. Copies of each of these documents will be distributed according to the CLP paper work instructions. All forms will be signed and dated by a member of the sampling team. Coolers will be identified with return address labels, "Fragile" and "This End Up" labels, and chain-of-custody seals will be placed on both the front and back of the cooler lid to insure sample custody is not broken in transit.

Sample Labels: Each bottle will be labeled with a pre-printed CLP traffic report number obtained from the RSCC. Each bottle will also contain a label that includes the CLP Case number, the station location, the date sampled, the analytical parameter and any preservative added to the sample. Sample labels will be covered with clear tape to prevent any possibility of them tearing or becoming wet.

6.8 QUALITY CONTROL SAMPLES

Field Duplicates: One duplicate sample will be taken at well MW-4. This well is known to contain elevated levels of contamination of various parameters. This sample will be labeled as such: MW-A1

Laboratory QC Sample: One QC sample will be collected at well MW-4. This well is known to contain elevated levels of contamination of various parameters. Twice the sample volume will be collected for this aliquot. This sample will be labeled to indicate that it is a QC sample.

Blank Samples: One blank sample will be collected each day of sampling. The blank will be collected by pouring metal free deionized-distilled water into laboratory prepared bottles identical to those used for other samples. Blank samples will be labeled: MW-E1, MW-E2, MW-E3, respectively according to the days taken. This information is also listed on Table 5-1.

7.0 HEALTH AND SAFETY PLAN

The Health and Safety Plan to be used with this plan is taken the CDM Workplan. A copy of the document is located in Appendix B.

8.0 REFERENCES

1. Camp Dresser & Mc Kee WORKPLAN, RCRA Facility Investigation
Southern California Chemical, June 8, 1990.
2. Camp Dresser & Mc Kee, CURRENT CONDITIONS REPORT and APPENDICES,
RCRA Facility Investigation, Southern California Chemical,
June 8, 1990.

TABLE 5-1 - REQUEST FOR ANALYSIS

MATRIX: GROUND WATER

CONCENTRATION: LOW

CHEMISTRY TYPE		ORGANICS & INORGANICS									
ANALYSES REQUESTED		RAS-SAS VOA's low	RAS Pest/PCB	RAS BNA	6010 Metals (Dissolved)	6010 Metals (Total)	SAS Anions 300	Cr(6+) 218.4	Hg 245.2	CN 9010	
PRESERVATIVES		Add 2 drops 1:1 HCl Chill to 4C	Chill to 4C	Chill to 4C	Filter HNO3 pH<2 Chill to 4C	HNO3 to pH<2 Chill to 4C	Chill to 4C	NaOH to pH>12 Chill to 4C	HNO3 to pH<2 Chill to 4C	NaOH to pH>12 Chill to 4C	
ANALYTICAL HOLDING TIME (s)		14 days	7 days	7 days	6 months	6 months	28 days NO2/NO3: 48hrs	24 hours	28 days	14 days	
CONTRACT HOLDING TIME (s)		10 days	5 days	5 days	25 days	25 days	Cl/SO4: 5 days NO2/NO3: 24hrs	24 hrs	26 days	12 days	
SAMPLE x SAMPLE		NO. OF BOTTLES PER ANALYSIS	NO. OF BOTTLES PER ANALYSIS	NO. OF BOTTLES PER ANALYSIS	NO. OF BOTTLES PER ANALYSIS	NO. OF BOTTLES PER ANALYSIS	NO. OF BOTTLES PER ANALYSIS	NO. OF BOTTLES PER ANALYSIS	NO. OF BOTTLES PER ANALYSIS	NO. OF BOTTLES PER ANALYSIS	TOTAL NO. OF BOTTLES PER WELL
SAMPLE LOCATION (and ID #)	SAMPLING SCHEDULE	3 x 40 ml glass vial	2 x 1 liter amber glass	2 x 1 liter amber glass	500 ml poly bottle	500 ml poly bottle	500 ml poly bottle	1 liter poly bottle	1 liter poly bottle	1 liter poly bottle	
MW-15S	DAY 1	3	2	2	1	1	1	1	1	1	13
MW-15D	DAY 1	3	2	2	1	1	1	1	1	1	13
MW-E1 Field Blank	DAY 1	3	2	2	1	1	1	1	1	1	13
MW-6B	DAY 2	3	2	2	1	1	1	1	1	1	13
MW-3	DAY 2	3	2	2	1	1	1	1	1	1	13
MW-E2 Field Blank	DAY 2	3	2	2	1	1	1	1	1	1	13
MW-A1 (Dup)	DAY 3	3	2	2	1	1	1	1	1	1	13
MW-4 (QC)	DAY 3	6	4	4	2	2	2	2	2	2	26
MW-4A	DAY 3	3	2	2	1	1	1	1	1	1	13
MW-E3 Field Blank	DAY 3	3	2	2	1	1	1	1	1	1	13
	TOTALS	33	22	22	11	11	11	11	11	11	143